



MARSHALL STAR

Serving the Marshall Space Flight Center Community

Dec. 20, 2007

Jan. 10 launch date still under consideration

Atlantis tanking test reveals open circuits in external tank wiring connector

By Sanda Martel

Open circuits in the feed-through connector that passes wires from the external tank's interior to the exterior were identified as the issue that prevented Atlantis' launch on Dec. 6 and Dec. 9.

In announcing the results of the Dec. 18 tanking test conducted at the Kennedy Space Center, Fla., Shuttle Program Manager Wayne Hale said engineers are working to better understand and correct the problem and fly when it's safe to fly.

NASA's Space Shuttle Program managers have targeted Jan. 10 for the launch of shuttle Atlantis' STS-122 mission to the International Space Station, but the liftoff date depends on the resolution of the problem in a fuel sensor system which gave false readings from the part of the system that monitors the liquid hydrogen section of the tank.

This Engine Cut Off — ECO — sensor system is one



Space shuttle Atlantis stands on Launch Pad 39A at the Kennedy Space Center, Fla.

of several that protects the shuttle's main engines by triggering their shut down if fuel runs unexpectedly low.

NASA managers set up two investigation teams for ECO sensor system troubleshooting.

See Launch on page 6

NASA selects prime contractor for Ares I rocket avionics

NASA has selected The Boeing Company of Huntsville as the prime contractor to produce, deliver and install avionics systems for the Ares I rocket that will launch the Orion crew exploration vehicle into orbit. The selection is the final major contract award for Ares I. The award resulted from a full and open competition.

The Ares I launch vehicle is a key component of the Constellation Program, which will send humans to the moon by 2020 to set up a lunar outpost. Boeing will support the NASA design team leading the development of the Ares I avionics components. The company also will develop and acquire avionics hardware for the rocket and assemble, inspect and integrate the avionics system components on the upper stage. Components will be manufactured by the prime contractor's suppliers across the country. Final integration and checkout will take

place at NASA's Michoud Assembly Facility in Louisiana.

The avionics are the "brains" of the Ares I and will provide guidance, navigation and control for the rocket until it reaches orbit. The avionics system is responsible for managing vehicle health and reporting it to flight controllers based on a sequence of timed events, such as engine shutdown and first stage separation.

The instrument unit that contains the bulk of the avionics will be situated between the two-stage Ares I rocket and the adapter that joins Ares I to the Orion spacecraft. The system consists of on board computers, flight controls, communications equipment and other instruments and software for monitoring and adjusting the rocket's speed and position during flight.

See Ares I on page 7

Georgia Tech opens new Nano-Technology Infusion Center

Marshall researchers can have independent technologies evaluated

By Lori Meggs

Marshall Center researchers have a new avenue to possibly spin NASA technologies into commercialized products — an exciting new venture with the Georgia Institute of Technology in Atlanta.

Marshall has been instrumental in developing the first Nano-Technology Infusion Center focused on bringing nano-scale solutions to traditional industry.

"This center — located on the Georgia Tech campus — provides a formal environment to evaluate Marshall technologies, and then hopefully we can buy it back as a commercialized product, saving money," said Fred Schramm of Marshall's Innovative Partnerships Program Office. "The technology spins back to us."

"The goal," added Schramm, "is for a NASA technology to be sent to this center for evaluation as an independent technology, be turned into a commercialized product and then be infused back into our missions."

The infusion center will be used to evaluate high-fidelity sensing devices, flow measurement tools and other feedback mechanisms to use in joint research programs or for immediate use in industry.

The Marshall Center is loaning equipment to Georgia Tech for an extended period of time through an already-established Space Act Agreement with the Carpet and Rug Institute in Dalton, Ga. This amounts to an in-kind contribution. As the primary funding agent for the infusion center, the carpet institute will be the first to use the facility.

The infusion center's first project involves using nano-codes — an identification process for very small objects — to control a manufacturing process for the carpet industry.

For example, the industry is attempting to determine how to measure the mixtures it uses to create carpet fibers. NASA may have developed a sensor for a specific space mission that could provide another way to do that.

The infusion center will test the effectiveness of the sensor using a NASA-inspired X-ray fluorescence sensing technology as a baseline to see how it could fit in a process-control system. The industry wants a dual method for process control and product identification.

Alternately, another industry may already have a sensor that NASA could use for a space

mission which could be commercialized and sold to NASA. The Nano-Technology Infusion Center would serve to connect that commercial source to the NASA mission need. Marshall partners with research universities to turn the results of theoretical research into tangible technologies.

"We understand that we're not the only smart people developing new technologies in the world, and the Marshall Center could be vital to locating technologies that are not finding their way to us," added Schramm.

If you have a technology to be considered for evaluation at the Nano-Technology Infusion Center, contact Schramm at 544-0823. A patent status on the technology must be verified.

The writer, an ASRI employee, supports the Office of Strategic Analysis and Communications.



David Higginbotham/MSFC

The Marshall Center's Fred Schramm, right, and Dr. Thomas Michaels from the Georgia Institute of Technology in Atlanta review a sample test sheet of a technology that will be evaluated at the Nano-Technology Infusion Center.

This month in history ...

Fifty years ago this month, America was preparing to launch the free world's first satellite. Engineers and scientists working for the Army in Huntsville were responsible for getting the launch vehicle ready.

In the meantime, the space race became part of the Cold War rhetoric between the United States and the Soviet



Union. Americans were disappointed when the Soviets launched Sputnik, the world's first artificial satellite, on Oct. 4, 1957. As part of the war of words, Sergei P. Korolev, who headed the design bureau that created the Soviet Union's Sputnik, was adamant about making the satellite appear impressive, declaring, "This ball will be exhibited in museums."

THE FACE OF MISSION SUCCESS IS:

Bryan Williford

Chief of the Solid Propulsion Support Office

In supporting Marshall's Shuttle Propulsion Office and the Ares Projects Office, Bryan Williford has his work cut out for him in managing contract specialists in support of solid propulsion elements. Williford, chief of the Solid Propulsion Support Office in the Space Transportation Support Office within the Office of Procurement, and his team help ensure their customers get the supplies they need to get to space.

What is your education background?

I received my bachelor's degree in economics in 1989 from East Carolina University in Greenville, N.C.

What are the key responsibilities of your job?

I lead a team of six contract specialists in providing a full-range of procurement support to the solid propulsion elements of Marshall's Shuttle Propulsion Office and the Ares Projects Office. For shuttle that covers the Reusable Solid Rocket Booster Project, and for Ares that covers the First Stage Element Office. Within the Ares projects, we also support requirements initiated by the offices of Program Planning and Control, Vehicle Integration, and Flight and Integrated Test.

My responsibility covers three tiers. From the customer perspective, my key responsibility is to understand their mission and procurement objectives and use the resources of the Solid Propulsion Support Office, and the larger Office of Procurement when appropriate, to efficiently and effectively achieve those objectives. As a manager, I have a responsibility of matching contract specialists with customer requirements to achieve the desired result while allocating the workload across the team as equitably as possible. As a supervisor, it's working with each individual in the office to make sure they have the tools they need to be successful, whether that's formal training, one-on-one coaching, or something else, and putting them in situations that grow their capabilities and maximize their value to the office.

What services does your job provide in support of the center's mission?

The majority of NASA's budget is spent on the acquisition of something — supplies, services, research and development, construction. A procurement professional at Marshall supports the

center's mission by helping customers navigate their requirements through the acquisition process. The process starts when a customer identifies a need and ends when a supply is delivered or a service is provided that fulfills the need of the customer. There can be a little

or a lot of activity between those two points depending on the complexity and magnitude of the requirement. On one end of the spectrum, it is something as straight-forward as a delivery order for furniture from the center-wide logistics contractor that can be awarded and closed in a matter of weeks. On the other end, we support complex procurements like the first stage acquisition of the Ares I rocket that began in September 2005. The prime contract was awarded in August of this year and continues through December 2014.

What do you hope to accomplish in your role this fiscal year?

Our Office was reorganized in October of this year to form along three product lines — solid propulsion, liquid propulsion and tankage.

Liquid propulsion covers shuttle main engine

and Ares J-2X. Tankage covers shuttle external tank, Ares I Upper Stage, and manufacturing support and facility operations at the Michoud Assembly Facility in New Orleans. In addition to providing our customers with a consistently outstanding level of support, I plan to create some cross-training opportunities for members of the team who typically support shuttle on a day-to-day basis to work actions on Ares and vice versa. There are a lot of challenges in both areas, and the more knowledge we have collectively about our two customers, the better positioned we'll be to meet those challenges.

What is the biggest challenge you face?

With the reorganization of our office, my biggest immediate challenge is coming up to speed with respect to the Reusable Solid Rocket Booster element of the office. For two years I've been focused on Ares and getting the prime contracts in place for the first stage and J-2X upper stage engine. As a supervisor, balancing the career needs of the individuals in the office with the needs of the office is another challenge. Each individual has a set of career goals and thoughts about how to best achieve them, and the office has a set of activities to support. In that mix is my constant



David Higginbotham/MSFC

Bryan Williford

See Williford on page 7

Marshall's Robert Shurney dies at age 86

Widely listed among African-Americans who have made significant contributions to aerospace, Robert Shurney, who retired from the Marshall Center in 1991, died Nov. 25.

Born in Dublin, Ga., Shurney graduated from Oakwood Academy in Huntsville in 1946. He received a bachelor's degree from Tennessee State University in Nashville in 1960 and joined the Marshall Center in 1962 where he held many engineering and technical management positions.

He worked for more than 15 years in Marshall's Systems Analysis and Integration Laboratory before accepting a position as a scientist and engineer in the Space Station Chief Engineers Office in the center's Science and Engineering Directorate.

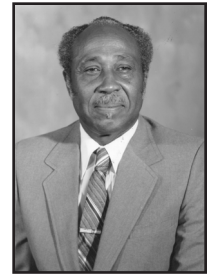
Astronaut Jim Lovell, who commanded the Apollo 13 mission, was among those who recognized Shurney's contributions. In an article titled "Soaring above the setbacks: African-Americans in space," Lovell wrote, "... there have been countless more

scientists, mathematicians, physicists, astronomers, doctors and engineers who made significant scientific, engineering and medical contributions."

As an example, Lovell cited Shurney's work on the design for the tires for the lunar roving vehicle used by astronauts to travel on the lunar surface. It was, writes Lovell, an "ingenious design" that "used wire mesh in place of rubber to save weight yet still provide the needed flexibility."

Shurney received a doctorate in physics in 1986 from Columbia Pacific University in Petaluma, Calif. Among other accomplishments, Shurney worked on the Saturn V launch vehicle, the Skylab space station, and conducted tests as a flight engineer on NASA's KC-135 aircraft.

Shurney is survived by four sons.



Robert Shurney

Japanese satellite Hinode captures cover of Science

By Jennifer Morcone

The cover image of the Dec. 7 issue of Science was provided to the journal by Jonathan Cirtain, a solar physicist new to the Marshall Center.

This and other images from NASA-funded telescopes on board the Japanese satellite Hinode shed new light about the sun's magnetic field and the origins of solar wind, which disrupts power grids, satellites and communications on Earth. This issue of Science features the latest scientific findings from Hinode by several international teams of researchers.

Cirtain joined Marshall's Science & Mission Systems Office from the Harvard-Smithsonian Astrophysics Observatory in Cambridge, Mass., where he made use of Hinode's X-ray telescope to capture the remarkable cover image. The still image taken January 10, 2007 clearly shows an X-ray jet launching plasma out into the solar system from the sun's north polar coronal hole.

"Capturing the cover of Science is a remarkable achievement," said John Horack, manager of the Science & Mission Systems Office. "Hinode is rewriting physics textbooks and revolutionizing our understanding of the sun's magnetic processes."

The solar wind is a stream of electrically charged gas that is propelled away from the sun in all directions at speeds of almost 1 million mph. Better understanding of the solar wind may lead to more accurate prediction of damaging radiation waves before they reach satellites.

How the solar wind is formed and powered has been the subject of debate for decades. Powerful magnetic Alfvén waves in the electrically charged gas near the sun have always been a leading candidate as a force in the formation of solar wind since Alfvén waves in principle can transfer energy from the sun's surface up through its atmosphere, or corona, into the solar wind. In the solar

atmosphere, Alfvén waves are created when convective motions and sound waves push magnetic fields around, or when dynamic processes create electrical currents that allow the magnetic fields to change shape or reconnect.

Using Hinode's high resolution X-ray telescope, Cirtain's team was able to peer low into the corona at the sun's poles and observe record numbers of X-ray jets. The jets are fountains of rapidly moving hot plasma. Previous research detected only a few jets daily.

With Hinode's higher sensitivity, Cirtain's team observed an average of 240 jets per day. They concluded that magnetic reconnection, a process where two oppositely charged magnetic fields collide and release energy, is frequently occurring in the low solar corona. This interaction forms both Alfvén waves and the burst of energized plasma in X-ray jets.

"These observations show a clear relationship between magnetic reconnection and Alfvén wave formation in the X-ray jets," said Cirtain. "The large number of jets, coupled with the high speeds of the outflowing plasma, lends further credence to the idea that X-ray jets are a driving force in the creation of the fast solar wind."

Hinode, Japanese for "sunrise," was launched in September 2006 to study the sun's magnetic field and how its explosive energy propagates through the different layers of the solar atmosphere. It is a collaborative mission with NASA and the space agencies of Japan, the United Kingdom, Norway and Europe and Japan's National Astronomical Observatory. Marshall manages science operations and managed the development of the scientific instrumentation provided for the mission by NASA, industry and other federal agencies.

To view Hinode observations visit <http://www.nasa.gov/solar-b>.

The writer supports the Office of Strategic Analysis and Communications

NSSTC lecture series celebrates 50 Years of space science

By Dauna Coulter and Jennifer Morcone

"I remember when Wernher von Braun first drew the trajectory of a four-stage rocket in the air with his finger," said Ernst Stuhlinger, chief scientist for the von Braun Apollo team, in his opening presentation at a Dec. 7 seminar sponsored by the National Space Science Technology Center and the National Academy of Sciences.

The National Academy of Sciences Space Studies Board chose the NSSTC to host the seminar series titled "Forging the Future of Space Science — the Next 50 Years," as one of the major events in celebration of the 50th anniversary of the International Geophysical Year.

Organized by an international council of scientists, the International Geophysical Year spanned 1957-58 and aimed to advance the geophysical sciences by conducting coordinated research globally. The crowning achievement of the IGY was launching of Soviet and American artificial satellites into Earth orbit.

"Most people remember Sputnik, but scientists celebrate the International Geophysical Year," said Marty Kress, NSSTC executive director and organizer of the day-long seminar series. "At the time, it was the largest scientific endeavor ever undertaken and it truly kicked off the Space Age."

Stuhlinger, the first speaker, set the tone for discussions about the past and future of space exploration. He shared that at the very beginning of the Space Age von Braun appreciated the need for high-quality scientific experiments to be integrated with the development of spacecraft. Other speakers during the morning panel discussion included author and Director Emeritus of the U.S. Space & Rocket Center Ed Buckbee; former astronauts Jan Davis and Owen Garriott; and retired Hubble Space Telescope Project Manager James Odom.

The second panel looked to the future with the theme, "Where are we going in science and exploration?" Melissa McGrath, chief scientist for NSSTC, moderated the panel which included presentations from Marshall scientists John Horack, Melissa McGrath, Barbara Cohen and Martin Weisskopf; NASA Deputy Associate Administrator for Science Programs Todd May; and Chief Executive Officer of the Space & Rocket Center Larry Capps.

Cohen, a lunar scientist new to the Marshall Center, described why we should go to the moon for continued study.

"Much of what we've learned about how to explore other planets



From left, John Horack, Martin Weisskopf and Barbara Cohen participate in a Dec. 7 seminar sponsored by the National Space Science Technology Center and the National Academy of Sciences called "Forging the Future of Space Science — the Next 50 Years."

we learned from exploring our moon, and our framework for understanding other planets was created through lunar exploration," said Cohen. "Now we're going to study the moon as a planet with the benefit of that knowledge. The Apollo landing sites collectively covered about 7 percent of the lunar surface. Translate that to Earth and imagine if you went to Canada a few times. What would you know about the Earth? Very little. Now we're going to go to totally new landing sites which will open new vistas and pathways for discovery."

To close the proceedings, Wesley Huntress, director emeritus of the Carnegie Institution's Geophysical Laboratory in Washington delivered an evening lecture at the Space & Rocket Center. Huntress described the moon as a Rosetta stone, providing a template for deciphering and understanding the history and evolution of the Earth and planets.

"We've come a long way in 50 years," said Huntress. "One day we'll find another planet, a blue dot circling another star, with oceans and continents, and that will be the most promising end product of the 21st century, just as Apollo was for the 20th century."

Morcone works in the Public & Employee Communications Office. Coulter, a Schafer Corp. employee, supports the Office of Strategic Analysis and Communications.

Marshall Star, Daily Planet take break for holidays

The Marshall Star, which is printed 50 times per year, will not publish for two weeks during the holiday season. This is the last issue of the year. Publication will resume Jan. 10. Classified ads

may still be submitted during this time.

The Daily Planet will cease publication Dec. 21 and resume Jan. 2.

Space Grant programs award more than \$300,000 in scholarships and fellowships

By Megan Norris

Thirty-nine top science and engineering students from seven Alabama research universities received scholarships and fellowships totaling \$308,000 from the NASA Space Grant College and Fellowship Program and the Alabama Space Grant Consortium member institutions.

The awards were presented by John Gregory, director of the Alabama Space Grant Consortium, during the Fellowship-Scholarship Awards Day ceremony, hosted by the Marshall Center's Academic Affairs Office. John Horack, manager of Marshall's Science & Mission Systems Office, was a guest speaker.

A tour of Marshall's X-ray Calibration Facility and the International Space Station Control Center concluded the program.

The National Space Grant College and Fellowship Program, implemented by NASA in 1989, contributes to the nation's space program by funding research, education and public service projects through a national network of 52 university-based Space Grant consortia.

As a participant in the program, the Alabama Space Grant Consortium promotes America's pre-eminence in aerospace into the next century. It includes seven Alabama universities that grant doctoral degrees — Auburn University, Tuskegee University, the University of Alabama at Birmingham, the University of South Alabama, the University of Alabama in Huntsville, Alabama A&M University and the University of Alabama in Tuscaloosa; as well as seven industrial affiliates and the U.S. Space & Rocket Center in Huntsville.

The writer, an ASRI employee, supports the Office of Strategic Analysis and Communications.



From left, V. Trent Montgomery, Alabama Space Grant Consortium campus director and dean of the School of Engineering and Technology at Alabama A&M University; John C. Gregory, director of the Alabama Space Grant Consortium; award recipient Elena Mitchell; Alabama A&M President Robert R. Jennings; award recipient Eugene Harris; and Teresa Merriweather Orok, Alabama A&M vice president for institutional research, planning and sponsored programs and associate director of the state Space Grant Consortium.



From left, Gerald R. Karr, Alabama Space Grant Consortium campus director and professor of mechanical and aerospace engineering at the University of Alabama in Huntsville; award recipient Ijeoma Okeke; fellowship recipients Dustin Wood and Matthew Orr; and scholarship recipients J. Michael Burgess and John Bailey III.

Launch

Continued from page 1

A "near-term" team is looking at what can be done to support a successful next launch attempt. Another team is seeking a longer term solution to the ECO sensor issue and members from throughout the agency are participating in the effort.

Both teams are focused on troubleshooting, analyzing several failure scenarios and testing hardware at the Marshall Center, the Kennedy Center and other locations across the country.

The Dec. 18 instrumented tanking test on Atlantis' fuel tank, ET-125, at the Kennedy Center consisted of placing instrumentation in the circuits to troubleshoot reoccurrence of the false sensor readings which were seen during the two launch attempts. Engineers and managers began analyzing the test results shortly

after the propellants were drained from the tank.

A tanking test consists of ground crews filling the shuttle external tank with liquid oxygen and liquid hydrogen fuel to evaluate how it performs — or in this particular case, how the ECO sensor system performs — under cryogenic conditions when the tank is filled with the two ultra low-temperature liquids.

Atlantis' main objective during its STS-122 mission to the space station is to deliver, install and activate the European Space Agency's Columbus laboratory, which will provide scientists around the world the ability to conduct a variety of life, physical and materials science experiments.

For the latest information about the STS-122 mission, visit http://www.nasa.gov/mission_pages/shuttle/main/index.html.

The writer, an ASRI employee, supports the Office of Strategic Analysis and Communications.

Ares I

Continued from page 1

Boeing will provide one instrument unit avionics ground test article, three flight test units and six production flight units to support integrated flight tests and missions through 2016. The contract type is cost-plus-award-fee and the period of performance is Dec. 17, 2007, through Dec. 16, 2016. The estimated value for support to the NASA-led design team and production of test and flight units is \$265,489,783. Additional tasks not included in the initial scope of the contract may be acquired up to a maximum value of \$420 million. Additional flight units may be obtained at an

estimated cost of \$114,045,292 for as many as 12 additional units. The total estimated contract value is \$799,535,079.

The Ares I first stage will be a five-segment solid rocket booster. The upper, second stage of the rocket will consist of a J-2X liquid-oxygen, liquid-hydrogen main engine, a new upper stage fuel tank, and the instrument unit avionics.

The Marshall Center manages the Ares Project for NASA's Constellation Program, based at NASA's Johnson Space Center in Houston.

For information about NASA's Constellation Program, visit <http://www.nasa.gov/constellation>.

Williford

Continued from page 3

challenge to accomplish the activities of the office as effectively and efficiently as possible and support the attainment of the career goals of each member of the team.

On the personal side, how do you like to spend your leisure time?

My wife Laura and I love spending time with our daughter, Lillian

Ann, because every day is a new day with a 2-year-old. Part of every evening is generally spent watching something that involves a mouse or princess, and learning the alphabet and numbers to 10. We live on 26 acres outside Ardmore, so there's usually something to get in to on the weekends, whether it's a do-it-yourself project or gardening.

Jessica Wallace, an ASRI employee and Marshall Star editor in the Office of Strategic Analysis and Communications, contributed to this article.

Classified Ads

To submit a classified ad to the Marshall Star, go to Inside Marshall, to "Employee Resources," and click on "Employee Ads — Submit Ad." Ads are limited to 15 words, including contact numbers. No sales pitches. Deadline for the next issue, Jan. 10, is 4:30 p.m. Thursday, Jan. 3.

Miscellaneous

Huntsville Memory Garden, Garden of Devotion, six adult spaces, \$2,195 each, negotiable. 859-4002
Kasson-Auburn pool table, fruitwood, Queen Anne feet, leather pockets, all accessories, \$1,950. 880-6563
Clayton Marcus sofa, beige, \$750. 206-0582
Boykin Spaniel puppies. 412-3406
Hummel figurines, \$75-\$600 each. 464-7847
Brookstone iSqueeze, \$300; 20-inch TV/VCR, \$75; antique ivory lamp, \$500; handcrafted silver boat, \$30. 325-2622
Three Quarter horses, Palomino colt, mare, sorrel stud, \$200 for all. 655-5384
Steve Mizerak 8-foot pool table, \$500. 461-9182
.75 carat diamond solitaire ring, wrap, .50 carat diamond band, diamond/sapphire ring, \$950 obo. 426-7862
Hardwood flooring, prefinished, 3/4 by 2 1/4, golden oak, 225 square feet, \$450. 417-5754
Eight-piece Victorian formal room furniture, matching

Aubusson rug, \$3,800 obo. 468-2354
Little Tikes family kitchen, \$25. 971-0518
Little Tikes Barbie Power Wheels Jeep, \$25; Little Tikes infant rocketship rope swing, \$12. 325-2919
Aura bass shakers, six pairs, for home theater seats, \$35 each. 520-1970
Ibanez RG170R electric guitar, black, \$100. 655-6293
20-inch Apex TV, \$35. 837-7732
V-Smile, five games, \$25; Little Tikes 3D Cruiser game, \$10. 325-6065

Vehicles

2007 Honda TRX450R Sport ATV/quad, electric start, plastics black/flames, red frame, \$4,950. 345-9555
2006 Honda CRF230F dirt bike, \$2,300 obo. 776-4741
2005 Honda VTX1300R Cruiser motorcycle, many accessories, 8,800 miles, \$7,500. 564-7499
2005 Suzuki Ozark F250 ATV, four-wheel drive, \$3,000 obo. 498-0506
2004 VW Jetta, manual, heated leather seats, sunroof, new tires, 41k miles, \$12,000 obo. 426-7862
2004 Harley-Davidson Road King Classic, pearl white, 14k miles, \$13,900. 776-0811
2003 Tahoe, leather, third-row seats, rear air, XM, CD, 59k miles, \$17,000. 468-0854
2002 Chevy Camaro, loaded, T-tops, 95k miles, \$7,900. 654-0078
2003 Toyota 4-Runner SR5, V6, sunroof, side airbags, new tires, 57k miles, \$16,500. 655-9638
2003 Ford Ranger, four door, gold, power locks/doors, 50k miles, \$10,200. 431-0582 or 810-8945
2001 Mazda Miata LX, tan leather, power windows, black,

61k miles, \$10,900. 883-6894 or 468-6894
1999 Lexus ES300, 21,100 miles, \$15,100. 890-0499
1998 Jeep Wrangler, Sahara edition, extras, white, beige interior, 105k miles, \$7,495. (931) 427-8048
1994 Ford conversion van, white, towing package, new brakes, 182k miles, \$2,500. 830-9507
1992 300SL Mercedes convertible, white, white hard top, 112k miles, \$13,000. 797-4336
1966 Chevelle SS396, four speed, yellow, black top, 104k miles, \$42,000 obo. 527-8798

Wanted

Double-wide, flat bottom Jon boat. 302-6783
Youth dirt bike, four-wheeler, used, 50cc, quality name brand. 755-2358
Dog kennel, 10x10x10. 682-3535
Fuser for HP LaserJet 5. 883-2757
White furniture for girl's bedroom. 684-6923
Used tractor, around 50 HP, front bucket. 426-0134

Found

One blue ladies' glove, Building 4200 area; USA mobility pager; pink Dress Barn bag with a brown and tan blouse, south parking lot of Building 4203. 544-4680

Free

Beagle puppies, female, non-registered, ready Dec. 24. 784-5299
Cocker/Sheltie mix, black, 25 pounds, house trained. 658-1939

Lost

Hobie black-frame sunglasses, Building 4200, south parking lot. 544-7401



Marshall employees celebrate '50 Years of Holiday Cheer'

Marshall Center employees ring in the holiday season with the annual Center Director's Holiday Reception on Dec. 11. The reception, in the Marshall Activities Building 4316, featured music, food and a visit from Santa Claus. Food items collected at the event were donated to the North Alabama Food Bank in Huntsville.

David Higginbotham/MSFC

Small Business Innovation Research program executive visits Marshall

NASA Small Business Innovation Research Program Executive Carl Ray, right, and Helen Stinson, left, who served 15 years within NASA's SBIR program at the Marshall Center, watch as Tim Pickens, center, president of Orion Propulsion in Madison, Ala., demonstrates a rocket thruster developed by his company. Ray was on the first leg of his tour of NASA centers to meet with managers and visit with successful companies in the program, such as Orion. Ray and Stinson also visited Quantum Devices in Barneveld, Wis., an SBIR-funded company that is using Light-Emitting Diodes, known as LEDs, to explore various medical applications. LED is a NASA technology originally used to grow plants in space. The small business program seeks innovations that contribute to NASA missions and also have potential commercial applications. Lynn Garrison is the new SBIR integration manager at Marshall.



Doug Stoffer/MSFC

Obituaries

Harrison Benjamin Garrett, 76, of Decatur died Nov. 10. He retired from the Marshall Center in 1995 as an aerospace engineer.

Forrest T. Wells, 85, of Huntsville died Nov. 10. He retired from the Marshall Center in 1980 as an engineer.

MARSHALL STAR

Vol. 48/No. 14

Marshall Space Flight Center, Alabama 35812
(256) 544-0030
<http://www.nasa.gov/centers/marshall>

The Marshall Star is published every Thursday by the Public and Employee Communications Office at the George C. Marshall Space Flight Center, National Aeronautics and Space Administration. Classified ads must be submitted by 4:30 p.m. Thursday, and other submissions no later than 5 p.m. Friday to the Marshall Public and Employee Communications Office (CS20), Building 4200, Room 102. Submissions should be written legibly and include the originator's name. Send e-mail submissions to: intercom@msfc.nasa.gov. The Star does not publish commercial advertising of any kind.

Manager of Public and Employee
Communications — Dom Amatore
Editor — Jessica Wallace



U.S. Government Printing Office 2008-723-022-20129

PRST STD
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PERMIT NO. 298